

Nomenclature Committee of the International Union of Biochemistry and Molecular Biology (NC-IUBMB)

In consultation with the IUPAC-IUBMB Joint Commission on Biochemical Nomenclature (JCBN)

Enzyme Nomenclature

Recommendations of the Nomenclature Committee of the International Union of Biochemistry and Molecular Biology on the Nomenclature and Classification of Enzymes by the Reactions they Catalyse

<http://www.chem.qmul.ac.uk/iubmb/enzyme/>

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To SEARCH for Information on Enzymes on the Database CLICK HERE.

This page contains general information on enzyme nomenclature. It includes links to individual documents, and the number of these will increase as more sections of the enzyme list are revised. It also provides advice on how to suggest new enzymes for listing, or correction of existing entries.

Historical Introduction

In *Enzyme Nomenclature* 1992 there was an historical introduction. This web version is slightly edited from that in the book.

Printed Version

Published in *Enzyme Nomenclature* 1992 [Academic Press, San Diego, California, ISBN 0-12-227164-5 (hardback), 0-12-227165-3 (paperback)] with Supplement 1 (1993), Supplement 2 (1994), Supplement 3 (1995), Supplement 4 (1997) and Supplement 5 (in *Eur. J. Biochem.* 1994, **223**, 1-5; *Eur. J. Biochem.* 1995, **232**, 1-6; *Eur. J. Biochem.* 1996, **237**, 1-5; *Eur. J. Biochem.* 1997, **250**, 1-6, and *Eur. J. Biochem.* 1999, **264**, 610-650; respectively) [Copyright IUBMB].

Each enzyme has recorded at the end details of when first published in *Enzyme Nomenclature* or when added to the database and its subsequent history.

Web Version of Enzyme Nomenclature

The complete contents of *Enzyme Nomenclature*, 1992 (plus subsequent supplements and other changes) are listed below in enzyme number order giving just the recommended name. Each entry provides a link to details of that enzyme. Alternatively if looking for a specific reaction used in the classification of enzymes the broad outline defined by the first two numbers are given below. Each of these subclass entries is linked to a location where the category is subdivided to sub-subclasses. These in turn are linked to a list of recommended names for each enzyme in the sub-subclass.

List of Recommended Names for Enzymes

The common names of all listed enzymes are listed below, along with their EC numbers. Where an enzyme has been deleted or transferred to another EC number, this information is also indicated. Each list is linked to either **separate** entries for each entry or to files with **up to 50** enzymes in each file.

Common Names for:	List linked to:	
EC 1.1 to EC 1.3	separate	up to 50
EC 1.4 to EC 1.97	separate	up to 50
EC 2.1 to EC 2.4.1	separate	up to 50
EC 2.4.2 to EC 2.9	separate	up to 50
EC 3.1 to EC 3.3	separate	up to 50
EC 3.4 to EC 3.12	separate	up to 50
EC 4	separate	up to 50
EC 5	separate	up to 50
EC 6	separate	up to 50

Proposed additions and changes to this list are given separately (details below).

Glossary, Reaction pathways and Links to Other Databases

A start has been made in showing the pathways in which enzymes participate. Thus, for example, a link under EC 5.3.3.2 (isopentenyl-diphosphate isomerase) leads to the pathway from mevalonate to terpenes, and links under EC 1.14.99.7 (squalene monooxygenase) and EC 5.4.99.7 (lanosterol synthase) lead to pathways of steroid formation. For other enzymes a glossary entry has been added which may be just a systematic name or a link to a graphic representation. The glossary from *Enzyme Nomenclature*, 1992 may also be consulted. This has been updated with subsequent glossary entries. Each enzyme entry has links to other databases. For recent entries these may not yet have been implemented on the other database. For details on the information provided click here.

Enzyme Supplement 6, 7, 8, 9 and 10 (electronic only)

Six documents listing additions and corrections to previous entries were approved in 2000. These together form Supplement 6.

Five documents were approved in 2001 and form Supplement 7.

Three documents (six files) were approved in 2002 and form Supplement 8.

Three documents (five files) have been approved in 2003 and form Supplement 9.

Three documents have been approved in 2004 and form Supplement 10.

Six documents have been approved in 2005 and form Supplement 11.

Four files have been approved in 2006 and form Supplement 12.

Two files have been approved in 2007 and form Supplement 13.

One files has been approved in 2008 and form Supplement 14.

Minor corrections or changes are listed separately.

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Proposed New Entries and Revised Entries

Proposals for new entries to the Enzyme List and revisions of previously published entries are available from the following files:

[New Enzymes](#) (added July 2006)

Suggestions and comments should be made to [Professor K.F. Tipton and Dr S. Boyce](#) (Department of Biochemistry, Trinity College Dublin, Dublin 2, Ireland).

How to suggest new entries and correct existing entries

Information about [new enzymes](#) or [corrections](#) to existing entries may be reported directly from these web pages or by using the form printed in the back of *Enzyme Nomenclature*. [Advice](#) is available on how to suggest new enzymes for listing, or corrections of existing entries. Comments and suggestions on enzyme classification and nomenclature also may be sent to [Professor K.F. Tipton and Dr S. Boyce](#) Department of Biochemistry, Trinity College Dublin, Dublin 2, Ireland (E-mail: sboyce@tcd.ie).

Rules for the Classification and Nomenclature of Enzymes

In *Enzyme Nomenclature* 1992 there was a section on general principles; recommended and systematic names; scheme of classification and numbering of enzymes; and rules for classification and nomenclature. This [web version](#) is slightly edited from that in the book.

Enzyme Subclasses

The links are to a list of **sub-subclasses** which in turn list the enzymes linked to separate files for each enzyme, *or* to a list as part of a file with **up to 50** enzymes per file.

Subclass	Name	Enzyme file type	
EC 1	Oxidoreductases		
EC 1.1	Acting on the CH-OH group of donors	sub-subclasses	up to 50
EC 1.2	Acting on the aldehyde or oxo group of donors	sub-subclasses	up to 50
EC 1.3	Acting on the CH-CH group of donors	sub-subclasses	up to 50
EC 1.4	Acting on the CH-NH ₂ group of donors	sub-subclasses	up to 50
EC 1.5	Acting on the CH-NH group of donors	sub-subclasses	up to 50
EC 1.6	Acting on NADH or NADPH	sub-subclasses	up to 50
EC 1.7	Acting on other nitrogenous compounds as donors	sub-subclasses	up to 50
EC 1.8	Acting on a sulfur group of donors	sub-subclasses	up to 50
EC 1.9	Acting on a heme group of donors	sub-subclasses	up to 50

EC 1.10	Acting on diphenols and related substances as donors	sub-subclasses	up to 50
EC 1.11	Acting on a peroxide as acceptor	sub-subclasses	up to 50
EC 1.12	Acting on hydrogen as donor	sub-subclasses	up to 50
EC 1.13	Acting on single donors with incorporation of molecular oxygen (oxygenases)	sub-subclasses	up to 50
EC 1.14	Acting on paired donors, with incorporation or reduction of molecular oxygen	sub-subclasses	up to 50
EC 1.15	Acting on superoxide radicals as acceptor	sub-subclasses	up to 50
EC 1.16	Oxidising metal ions	sub-subclasses	up to 50
EC 1.17	Acting on CH or CH ₂ groups	sub-subclasses	up to 50
EC 1.18	Acting on iron-sulfur proteins as donors	sub-subclasses	up to 50
EC 1.19	Acting on reduced flavodoxin as donor	sub-subclasses	up to 50
EC 1.20	Acting on phosphorus or arsenic in donors	sub-subclasses	up to 50
EC 1.21	Acting on X-H and Y-H to form an X-Y bond	sub-subclasses	up to 50
EC 1.97	Other oxidoreductases	sub-subclasses	up to 50
EC 2	Transferases		
EC 2.1	Transferring one-carbon groups	sub-subclasses	up to 50
EC 2.2	Transferring aldehyde or ketonic groups	sub-subclasses	up to 50
EC 2.3	Acyltransferases	sub-subclasses	up to 50
EC 2.4	Glycosyltransferases	sub-subclasses	up to 50
EC 2.5	Transferring alkyl or aryl groups, other than methyl groups	sub-subclasses	up to 50
EC 2.6	Transferring nitrogenous groups	sub-subclasses	up to 50
EC 2.7	Transferring phosphorus-containing groups	sub-subclasses	up to 50
EC 2.8	Transferring sulfur-containing groups	sub-subclasses	up to 50
EC 2.9	Transferring selenium-containing groups	sub-subclasses	up to 50
EC 3	Hydrolases		
		sub-	

EC 3.1	Acting on ester bonds	subclasses	up to 50
EC 3.2	Glycosylases	sub-subclasses	up to 50
EC 3.3	Acting on ether bonds	sub-subclasses	up to 50
EC 3.4	Acting on peptide bonds (peptidases)	sub-subclasses	up to 50
EC 3.5	Acting on carbon-nitrogen bonds, other than peptide bonds	sub-subclasses	up to 50
EC 3.6	Acting on acid anhydrides	sub-subclasses	up to 50
EC 3.7	Acting on carbon-carbon bonds	sub-subclasses	up to 50
EC 3.8	Acting on halide bonds	sub-subclasses	up to 50
EC 3.9	Acting on phosphorus-nitrogen bonds	sub-subclasses	up to 50
EC 3.10	Acting on sulfur-nitrogen bonds	sub-subclasses	up to 50
EC 3.11	Acting on carbon-phosphorus bonds	sub-subclasses	up to 50
EC 3.12	Acting on sulfur-sulfur bonds	sub-subclasses	up to 50
EC 3.13	Acting on carbon-sulfur bonds	sub-subclasses	up to 50
EC 4	Lyases		
EC 4.1	Carbon-carbon lyases	sub-subclasses	up to 50
EC 4.2	Carbon-oxygen lyases	sub-subclasses	up to 50
EC 4.3	Carbon-nitrogen lyases	sub-subclasses	up to 50
EC 4.4	Carbon-sulfur lyases	sub-subclasses	up to 50
EC 4.5	Carbon-halide lyases	sub-subclasses	up to 50
EC 4.6	Phosphorus-oxygen lyases	sub-subclasses	up to 50
EC 4.99	Other lyases	sub-subclasses	up to 50
EC 5	Isomerases		
EC 5.1	Racemases and epimerases	sub-subclasses	up to 50
EC 5.2	<i>cis-trans</i> -Isomerases	sub-subclasses	up to 50
EC 5.3	Intramolecular isomerases	sub-subclasses	up to 50

EC 5.4	Intramolecular transferases (mutases)	sub-subclasses	up to 50
EC 5.5	Intramolecular lyases	sub-subclasses	up to 50
EC 5.99	Other isomerases	sub-subclasses	up to 50
EC 6	Ligases		
EC 6.1	Forming carbon—oxygen bonds	sub-subclasses	up to 50
EC 6.2	Forming carbon—sulfur bonds	sub-subclasses	up to 50
EC 6.3	Forming carbon—nitrogen bonds	sub-subclasses	up to 50
EC 6.4	Forming carbon—carbon bonds	sub-subclasses	up to 50
EC 6.5	Forming phosphoric ester bonds	sub-subclasses	up to 50
EC 6.6	Forming nitrogen—metal bonds	sub-subclasses	up to 50

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IUBMB Enzyme Nomenclature

EC 2.4.1.10

Accepted name: levansucrase

Reaction: sucrose + [(2→6)-β-D-fructosyl]_n = glucose + [(2→6)-β-D-fructosyl]_{n+1}

Other name(s): sucrose 6-fructosyltransferase; β-2,6-fructosyltransferase; β-2,6-fructan:D-glucose 1-fructosyltransferase; sucrose:2,6-β-D-fructan 6-β-D-fructosyltransferase

Systematic name: sucrose:(2→6)-β-D-fructan 6-β-D-fructosyltransferase

Comments: Some other sugars can act as D-fructosyl acceptors.

Links to other databases: [BRENDA](#), [EXPASY](#), [GTD](#), [KEGG](#), [ERGO](#), [PDB](#), CAS registry number: 9030-17-5

References:

1. Hehre, E.J. Enzymic synthesis of polysaccharides: a biological type of polymerization. *Adv. Enzymol. Relat. Subj. Biochem.* 11 (1951) 297-337.
2. Hestrin, S., Feingold, D.S. and Avigad, G. The mechanism of polysaccharide production from sucrose. 3. Donor-acceptor specificity of levansucrase from *Aerobacter levanicum*. *Biochem. J.* 64 (1956) 340-351. [PMID: 13363847]
3. Reese, E.T. and Avigad, G. Purification of levansucrase by precipitation with levan. *Biochim. Biophys. Acta* 113 (1966) 79-83. [PMID: 5940635]

[EC 2.4.1.10 created 1961]

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